Professor Bailey,[1] with a horticulturist's bias, most admirably teaches both pupil and teachers how to study twigs and buds, leaves and foliage, flowers, fructification, propagation, the behaviors and habits of plants, and the kinds of plants — to which he adds suggestive paragraphs on pedagogical methods, books, classification, evolution, and the interpretation of nature and the growing of plants. Nothing could be better in its way — and it is a very good way — than this addition to the products of the pen of a versatile and prolific writer.

Professor Barnes,[2] from the point of view of the physiologist, attempts to exhibit to pupils 13 to 18 years of age, who are engaged in genuine laboratory study, the variety and progressive complexity of the vegetative body, to explain the unity of plan in both the structure and action of the reproductive organs, and to give an outline of the more striking ways in which plants adapt themselves to the world about them. It is to be feared that he has aimed over their heads.

Professor Atkinson,[3] perhaps with less leaning toward any one side, gives fourteen chapters to physiology, twenty-one to morphology, eight to lessons on plant families, and thirteen to ecology.

Each of these books is good. If one could have only one of them, he would probably choose the first or the last noticed, which happen to come from the same faculty — that of Cornell University. But the point of view is so different that whichever he had, he would wish to complement it with the other — or to write his own book. T.

Rhodora[4] is the euphonious title of a new journal, started with the current year, by the New England Botanical Club. It is well gotten up, and under the editorship of Dr. B. L. Robinson, of the Gray Herbarium of Harvard University, it is sure to be well conducted. The initial number contains the following articles: Fernald, Rattle-

[1] Bailey, L. H. *Lessons with Plants.* New York, The Macmillan Company, 1898. Pp. xxxi + 491, 446 ff. — *First Lessons with Plants*, being an abridgment of *Lessons with Plants.* New York, The Macmillan Company, 1898. Pp. x + 117, 116 ff.

[2] Barnes, C. R. *Plant Life Considered with Especial Reference to Form and Function.* New York, Henry Holt & Company, 1898. Pp. x + 428, 415 ff.

[3] Atkinson, G. F. *Elementary Botany.* New York, Henry Holt & Company, 1898. Pp. xxiii + 444, 509 ff.

[4] *Rhodora*, Journal of the New England Botanical Club. Price, $1.00 per year ($1.25 to all foreign countries, except Canada). Editorial communications to be addressed to B. L. Robinson, 42 Shepard Street, Cambridge, Mass. Subscriptions, etc., to W. P. Rich, 3 North Market St., Boston, Mass.

snake-plantains of New England; Brainerd, Saniculas of western Vermont; Collins, Notes on algæ, 1; Deane, A prolific gentian; Williams, Myosotis collina in New England; Robinson, A new wild lettuce (*L. Morssii*) from Massachusetts; Webster, Notes on some fleshy fungi found near Boston; Manning, Matricaria discoidea in eastern Massachusetts.

The Gametophyte of Botrychium virginianum.[1]—Until this publication of Mr. Jeffrey our knowledge of the development of the embryo of Botrychium was practically none, and the previous accounts of the prothallus have been very insufficient. The material used in his investigation was gathered in its natural habitat — a sphagnum bog in which he found an abundance of prothalli in all stages. Owing to the extreme delicacy of the objects, great difficulty was experienced in mining them into paraffin. An ingenious dialyzer rotated by clock-work was employed to insure the more gradual yet sufficiently rapid osmosis between the benzole and the alcohol.

The gametophyte of *B. virginianum* is subterranean and without chlorophyll, and harbors a fungus of a phycomycetous type which the author regards as possibly symbiotic with the prothallus. On the gametophyte, which is oval in shape and beset with rhizoids, are borne both the antheridia and archegonia. The former above the latter on the sides. The antheridia, which develop from a single superficial cell, possess a double outer wall like those of other Ophioglossaceæ known, and the antherozoids are of the usual type of the Filicineæ. The archegonium is somewhat less elaborate than that of the typical fern, and it is to be noticed that the canal cell while binucleate does not show any division of its protoplast. In the development of the egg-cell the usual divisions forming the octants are seen, but the walls of the latter soon lose their identity and the embryo is relatively many-celled before the organs appear. The root, shoot, and cotyledon originate from the upper part of the embryo — *i.e.*, probably the upper octants. The cotyledon is apparently a secondary formation in the region of the shoot. The foot which is large arises from the whole lower portion of the embryo. The growing region of the root, shoot, and cotyledon is in each case a single apical cell. The root develops most rapidly at first, followed by the cotyledon, a reversal of the condition found in *Ophioglossum pedunc-*

[1] Jeffrey, E. C. The Gametophyte of Botrychium virginianum, *Trans. Canad. Inst.* (1896–97). Reprinted for University of Toronto Studies (1898), *Biol. Series*, No. 1.